National Aeronautics and Space Administration

NASA

Launch Vehicle

Pegasus XL

Launch Location

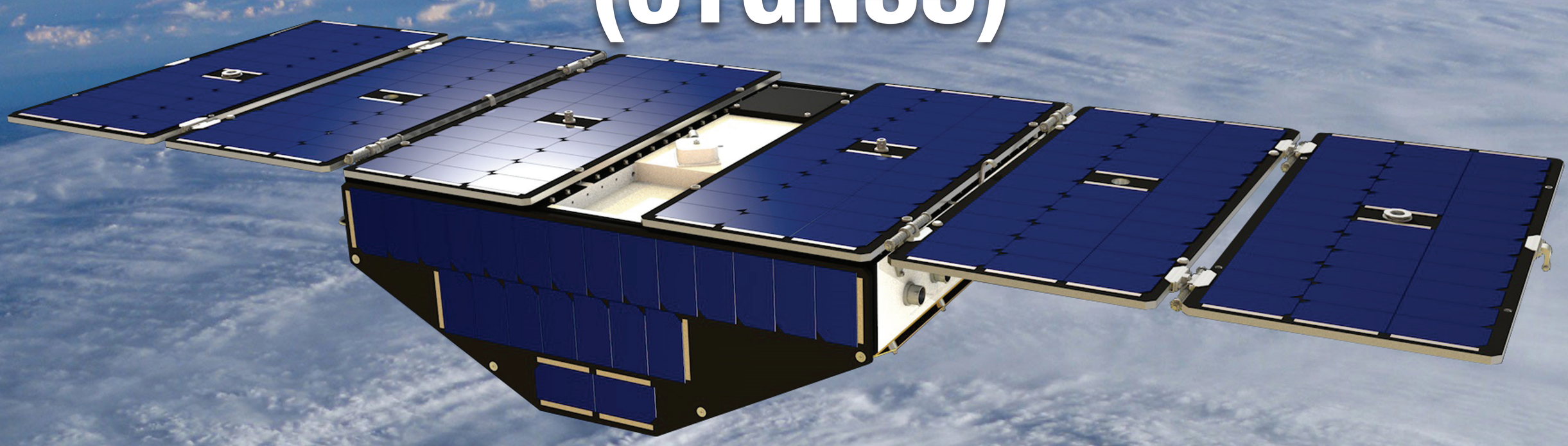
Cape Canaveral Air Force Station, FL

Launch Date

2016

NASA's Launch Service Program Presents...

Cyclone Global Navigation Satellite System (CYGNSS)



The same GPS technology that helps people get where they're going in a car will soon be used in space to impact hurricane forecasting. The technology is a key capability in a NASA mission called the Cyclone Global Navigation Satellite System (CYGNSS).

The CYGNSS mission will use eight micro-satellites to measure wind speeds over Earth's oceans, increasing the ability of scientists to understand and predict hurricanes. Each satellite will collect information based on the signals from four GPS satellites.

CYGNSS is taking a novel approach to calculate wind speeds that both reduces the mission's cost and gathers more data as well.

Typically, measuring wind speed over the oceans from space uses a technique called scatterometry. A radar instrument aboard a satellite sends a signal to the ground, and measures the signal strength reflected back to it. Building both sending and receiving capabilities into a single instrument, however, is more expensive than the method being used on CYGNSS.

The CYGNSS satellites will only receive signals broadcast to them from GPS satellites already orbiting the Earth and the reflection of the same satellite's signal reflected from the earth. The CYGNSS satellites themselves will not broadcast.

The use of eight satellites will also increase the area on Earth that can be measured. The instruments will be deployed separately around the planet, with successive satellites passing over the same region every 12 minutes. As the CYGNSS and GPS constellations move around the earth, the interaction of the two systems will result in a new image of wind speed over the entire tropics every few hours, compared to every few days for a single satellite. This data will be shared with NOAA and used to help emergency managers make decisions regarding extreme weather planning.

https://www.nasa.gov/cygnss/overview